

Notice of Allowability

Applicati n No.

10/091,776

Examiner

Terry L Englund

Applicant(s)

KIMURA, KATSUJI

Art Unit

2816

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amdt (Oct 27, 2004) and Interview (Jan 6, 2005).
2. ☒ The allowed claim(s) is/are 2-11, 17-21 and 27-31(now renumbered 2-11, 15-16, 19, 17-18, 20, 12-13, 1, and 14, respectively).
3. ☒ The drawings filed on 23 May 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 01062005.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


TIMOTHY P. CALLAHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

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EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to the applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with the applicant's representative Norman P. Soloway (Reg. No. 24,315) on Jan 6, 2005.

The application has been amended as follows:

Claims 12-14 and 22-25: cancelled in their entirety.

These claims, which had been previously withdrawn from consideration, were cancelled to place the present application into condition for allowance.

RESPONSE TO AMENDMENT/RCE

The amendment submitted Oct 27, 2004, and the RCE submitted on Dec 3, 2004, were reviewed and considered with the following results:

The RCE was approved and entered. Therefore, the amendment was entered for consideration.

Amended claims 18-19 overcame their respective objection described in the previous Office Action, which have now been withdrawn.

Amended claims 28, and 30-31 overcame the prior art rejections of claims 28-31 that were described in the previous Office Action. Therefore, the following rejections have been withdrawn: 1) claims 28-29 under 35 U.S.C. 102(b) with respect to McNeill et al.; and 2) claims 30-31 under 35 U.S.C. 103(a) with respect to McNeill et al. The output terminal of second OTA

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116 is coupled to input terminal + through resistor 124, and therefore is not directly connected as now recited within each of independent claims 28, and 30-31. Although one of ordinary skill in the art understands an amplifier can have direct feedback, or the resistance within a feedback line can be varied as a means to adjust the amplifier's gain, McNeill's resistor 124 is required to provide the ratio of resistance values $R1/R2$ (e.g. see column 5, lines 36-41). Therefore, there is no motivation remove McNeill's resistor 124 to make the direct connection between output terminal VBG/N4 and input terminal + of OTA 116.

Since the previously withdrawn claims 12-14 and 22-25 had not yet been cancelled, the applicant's amendment had not placed the present application in condition for allowance. However, those claims were cancelled by the Examiner's Amendment described above.

Therefore, there is no known objection or rejection remaining within the present application.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

None of the prior art references reviewed and considered shows or discloses a CMOS reference voltage circuit, comprising the combination of: 1) first/second diode-connected transistors, first/second emitter-ground bipolar transistors having a base connected to a collector, or a cathode grounded diode and an emitter-grounded bipolar transistor having a base connected to a collector; 2) first/second operational transconductance amplifiers (OTAs), or at least two differential pairs; and 3) at least one current mirror circuit, as recited within each of independent claims 2-7, 17-19, 21, 28, and 30-31. More specifically, none of the references clearly shows or discloses at least: 1) the first/second OTAs having equal transconductances, and the current

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mirror circuit having a current ratio of 1:K2 with $K2 > 1$, as recited within claim 2; 2) the first/second OTAs having transconductances set so $gm1 = K2 \times gm2$ with $K2 > 1$, and the current mirror circuit's current ratio is 1:1, as recited within claim 3; 3) the first/second OTAs having transconductances set at $gm1 = K3 \times gm2$ with $K3 > 1$, and a current ratio of the current mirror circuit set to 1:K2 with $K2 > 1$, as recited within claim 4; 4) the means for amplifying/summing comprises $(K2 + 1)$ differential pairs as recited within each of claims 5-6, wherein K2 is an integer greater than 1 (claim 5), or 2 (claim 6); 5) one of the transistors within the second differential pair is diode-connected and driven by a current proportional to an output current of one transistor of the first differential pair as recited within claim 7 (upon which claims 8-11 depend); 6) the reference voltage output is given by $V_{BE2} + \{K2 \times \Delta V_{BE} \times gm1\}/gm2$ as recited within claim 17; 7) the current mirror circuit has a plural number of output ends, and the reference voltage circuit also comprises third to $(K2 + 1)$ differential pairs, as recited within claim 18 (upon which claim 20 depends); 8) first/second current mirror circuits, as well as first to $(K2 + 1)$ differential pairs of MOS transistors, wherein $K2 \geq 3$, as recited within claim 19 (upon which claim 27 depends); 9) the second differential pair of MOS transistors has one transistor with its gate and drain connected together with the output end of the current mirror circuit as recited within claim 21; 10) the output terminal of the second OTA is directly connected to its second input terminal as recited within in claim 28 (upon which claim 29 depends); and 11) the output terminal of the second OTA is directly connected to its first input terminal as recited within each of claims 30-31. Since there is no motivation to modify or combine any prior art reference(s) to ensure any of these specific limitations are met, these claims are deemed patentably distinct over the prior art of record.

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Claims 2-11, 17-21, and 27-31 are allowed and have been renumbered as claims 2-11, 15-16, 19, 17-18, 20, 12-13, 1, and 14, respectively for printing purposes. The renumbering takes into account the cancellation of claims 1, 12-16, and 22-26, and also regroups some of the dependent claims closer with their respective independent claim. For example, claim 20 depends on claim 18, and claim 27 depends on claim 19.

Any comments considered necessary by the applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Any inquiry concerning this communication, or previous communications, from the examiner should be directed to Terry L. Englund whose telephone number is (571) 272-1743. The examiner can normally be reached Monday-Friday from 7 AM to 3 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan, can be reached on (571) 272-1740.

The new central official fax number is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1562.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Terry L. Englund

6 January 2005